

## A F F I D A V I T

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I, Charal Lin being duly sworn, depose and say:

That I am thoroughly conversant with the Chinese and English languages, that I have carefully read the attached translation and compared same with original document in Chinese language (the application number 92204479), that said translation is a true and correct version of such original, to the best of my knowledge and belief.

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Date: February 16, 2004

## CARD CONNECTOR

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates to a card connector, and particularly relates  
5 to a card connector adopted for receiving an electronic card inserted therein, so  
as to electrically connect an electrical circuit or a card connector of a storage  
device.

#### 2. Background of the Invention

Generally speaking, an IC card is a data input device and can electrically  
10 connect an electrical circuit or a storage device; the storage device can be a text  
processor, a personal computer or another circuit structure. The IC card be  
portable and can be saved data for transferring documents into the electrical  
circuit, the IC card can be ejected and inserted alternatively and easily.

Referring to Fig. 1, a connectional card connector adopted for an IC card  
15 ejecting and inserting alternatively and easily includes an insulating housing 60,  
a plurality of first contacts 61, a second contacts 62 and a third contact 63. The  
insulating housing 60 has a base 64, two lateral side frames 65 connecting the  
base 64, and a receiving cavity 66 formed between the base 64 and the two  
lateral side frames 65 for the IC card received therein.

20 The first contacts 61 are arranged in the base 64. When the IC card inserts  
into the receiving cavity 66, the first contacts 61 electrically connects  
corresponding terminals of the IC card. The first contacts 61 have ends extend  
outwardly respectively to mount on a circuit board, the first contacts 61

electrically connect the circuit board thereby.

The second contact 62 assembles on the insulating housing 60 and can be soldered on the circuit board for electrical connection; the second contact 62 includes a contact arm 67.

5 The third contact 63 mounts on the insulating housing 60 and has a resilient arm 68, the third contact 63 can be soldered in the circuit board for electrical connection, the resilient arm 68 of the third contact 63 arranges in front of the contact arm 67 of the second contact 62.

When the IC card inserts into the receiving cavity 66 of the insulating 10 housing 60, the IC card has an end retaining against and make the resilient arm 68 of the third contact 63 backwardly to contact the contact arm 67 of the second contact 62. The third contact 63 electrically contacts the second contact 62 thereby, and the IC card automatically and correspondingly starts.

However, the resilient arm 68 of the third contact 68 of the connectional 15 card connector is strip to swing accordingly. When the card connector is moved, carried, or assembled, the resilient arm 68 swings forwards to contact one of the first contacts 61, thus the third contact 63 misconnects the first contact 61.

Furthermore, to avoid the third contact 63 swinging forwardly to contact the first contact 61, the resilient arm 68 tilts too softly to generate pre-press 20 force. The resilient arm 68 is hard to orientate and influence the third contact 63 thereby.

With respect to an early design of a card connector, which includes an insulating housing 70, a plurality of first contacts 71, a second contact 72 and a third contact 73. The insulating housing 70 includes a base 74, two lateral side

frames 75 connecting the base 74, and a receiving cavity 76 formed between the base 74 and the two lateral side frames 75. The base 74 has a plurality of slots 77 containing the first contacts 71 respectively, the base 74 has a plurality of protruding grooves 78 projecting from two lateral side walls arranging in the 5 slots 77 respectively to prevent the first contacts 71 from swinging and loosing. The base 74 has a block 79 protruding therefrom for barricade and being higher than each of the protruding grooves 78. The block 79 connects a front head of one of the protruding grooves 78. The first contacts 71, the second contact 72 and the third contact 73 dispose in the insulating housing 70. The third contact 10 73 has a resilient arm 80 locates in front of a contact arm 81 of the second contact 72. The resilient arm 80 swings forwards to a certain degree to retain against the block 79 to orientate. Therefore, the resilient arm 80 will not touch any first contacts 71.

But the block 79 is not high enough to stop the resilient arm 80, especially 15 during carrying, moving, or assembling the card connector.

Hence, an improvement over the prior art is required to overcome the disadvantages thereof.

## **SUMMARY OF INVENTION**

The primary object of the invention is therefore to specify a card 20 connector including a resilient arm of a third contact, the resilient arm swings forwards to a predetermined angle to orientate without touching a first contact, therefore, during moving, carrying or assembling process, the resilient arm contacts the first contact that is effectively avoided.

The secondary object of the invention is therefore to specify a card

connector including a resilient arm of a third contact tilts with an inclined angle than that of the prior art to provide a pre-press force to orientate.

According to the invention, these objects are achieved by a card connector including an insulating housing, a plurality of first contacts, a second contact, and a third contact. The insulating housing includes a base, two lateral frames respectively connected thereof, and an insertion cavity formed among the base and the two lateral frames, wherein the base has a plurality of protruding grooves disposed thereon and a plurality of slots respectively defined between each two of the protruding grooves, one of the protruding grooves correspondingly has a block disposed thereon and defining a baffle surface formed thereon. The first contacts are respectively arranged in the slots. The second contact connects the insulating housing and having a contact arm. The third contact is assembled in the insulating housing and having a resilient arm, the resilient arm includes a baffle strip extending downwardly from a free end thereof, wherein the resilient arm arranges in front of the contact arm of the second contact, and the baffle strip disposes between the baffle surface of the block and a side surface of the corresponding protruding groove, the baffle strip retains against the baffle surface of the block to be oriented, while the resilient arm swings forwardly with a predetermined angle.

To provide a further understanding of the invention, the following detailed description illustrates embodiments and examples of the invention. Examples of the more important features of the invention thus have been summarized rather broadly in order that the detailed description thereof that follows may be better understood, and in order that the contributions to the art may be appreciated. There are, of course, additional features of the invention that will

be described hereinafter and which will form the subject of the claims appended hereto.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

These and other features, aspects, and advantages of the present invention  
5 will become better understood with regard to the following description,  
appended claims, and accompanying drawings where:

Fig. 1 is a perspective view of a conventional card connector;

Fig. 2 is a decomposition view of an early design of a card connector;

Fig. 3 is a decomposition view of the card connector according to the  
10 present invention;

Fig. 3A is an enlarged view of an A part of the card connector according to  
Fig. 3;

Fig. 4 is a perspective view of the card connector according to the present  
invention;

15 Fig. 5 is a top view of the card connector according to the present  
invention;

Fig. 6 is a perspective view of a second contact according to the present  
invention; and

20 Fig. 7 is a top view of the second contact according to the present  
invention.

## **DETAILED DESCRIPTION OF THE EMBODIMENTS**

Illustrated in Figs. 3 to 5, the present invention provides a card connector

adopted for an electronic card inserting or ejecting. The card connector includes an insulating housing 10, a plurality of first contacts 20, a second contact 30, and a third contact 40. The insulating housing 10 is made of plastic material, and includes a base 11, two lateral side frames 12 respectively connected to the base 11, and an insertion cavity 13 formed among the base 11 and the two lateral frames 12 for the electronic card receiving therein. The two lateral side frames 12 are made integrally from the base 11 in one piece to be in an U shape. The base 11 has a plurality of protruding grooves 15 disposed thereon and a plurality of slots 14 respectively defined between each two of the protruding grooves 15. The protruding grooves 15 are used for preventing the first contacts 20 swings or loosing. The base 11 has a block 16 disposed on a predetermined position thereof (see Fig. 3A), the block 16 is higher than the protruding grooves 15, the block 16 connects one of the protruding grooves 15 correspondingly and defining a baffle surface 161 formed thereon.

The first contacts 20 are made of metallic materials with high conductivity. The first contacts 20 are arranged in the slots 14 respectively to be secured therein. Each of the first contacts 20 has a contact portion 21 and an extending portion 22 extending out of the insulating housing 10. When the electronic card inserts into the insertion cavity 13, the contact portion 21 of each first contacts 20 electrically connects corresponding terminals of the electronic card. The extending portion 22 mounts on a circuit board for electrical connection.

The second contact 30 is made of metallic material with high conductivity. The second contact 30 includes a body 31, a contact arm 32, a soldering portion 33 and a resilient member 34, the contact arm 32 extends horizontally from an

upper edge of a first side of the body 31, the soldering portion 33 folds from a lower edge of the body 31, the resilient member 34 extends horizontally from an upper edge of a second side of the body 31. the resilient member 34 is about vertical to the contact arm 32.

5        The body 31 of second contact 30 assembles on a sidewall of the insulating housing 10. THE soldering portion 33 of the second contact 30 solders on the circuit board for electrical connection. The resilient member 34 further includes a fourth contact (not shown) disposed therewith, if there should be a control switch for anti-writing.

10       The third contact 40 is made of metallic material with high conductivity. The third contact 40 includes a main portion 41 and a welding portion 43, the resilient arm 42 extends horizontally from an upper edge of the main portion 41 and tilts with an inclined angle, and the welding portion 43 folds properly from a lower edge of the main portion 41 (with respect to Figs. 6, 7) to a certain degree. The resilient arm 43 tilts forwardly with the inclined angle. The resilient arm 43 includes a baffle strip 44 extending downwardly from a free end thereof, wherein the resilient arm 43 arranges in front of the contact arm 32 of the second contact 30, and the baffle strip 44 disposes in a corner 151, that locates between the baffle surface 161 of the block 16 and a side surface of the  
15       corresponding protruding groove 15, the baffle strip 44 retains against the baffle surface 161 of the block 16 to be oriented, while the resilient arm 43 swings forwardly with a predetermined angle. The third contact 40 includes a supporting portion 45 arranged in an inner side of the baffle strip 44.

The main portion 41 of the third contact 40 assembles on the base 11 of the

insulating housing 10. The welding portion 43 solders on the circuit board for electrical connection. The resilient arm 42 spaces a predetermined distance to the contact arm 32. The supporting portion 45 can straddle over the corresponding protruding groove 15 that connects the block 16. The resilient 5 arm 42 swings forwardly to a determined degree, the baffle strip 44 will retain against the baffle surface 161, thus the resilient arm 42 can be orientated.

The third contact 40 can provide detect function, when the electronic card inserts into the insertion cavity 13 of the insulating housing 10, the electronic card has an end retaining against and make the resilient arm 42 of the third 10 contact 40 backwardly to contact the contact arm 32 of the second contact 30. The third contact 40 electrically contacts the second contact 30 thereby, and the electronic card automatically and correspondingly starts.

The invention provides the card connector including the resilient arm 42 of the third contact 40 with the baffle strip 44 downwardly extending therefrom, 15 thus the resilient arm 40 swings forwards to the predetermined angle to retain against the baffle strip 44 and be orientated without touching the first contact 20. Due to the baffle strip 44 too higher to get over the baffle surface 161, the resilient arm 42 is prevented to touch the first contact 20 effectively during moving, carrying or assembling process.

20 The resilient arm 42 of the third contact 40 tilts with the inclined angle than that of the prior art to provide a pre-press force to orientate the resilient arm 42 to retain against the block 16. Accordingly, the third contact 40 provides the detect function correctly.

It should be apparent to those skilled in the art that the above description is

only illustrative of specific embodiments and examples of the invention. The invention should therefore cover various modifications and variations made to the herein-described structure and operations of the invention, provided they fall within the scope of the invention as defined in the following appended 5 claims.

WHAT IS CLAIMED IS:

1. A card connector comprising:
  - an insulating housing including a base, two lateral frames respectively connected thereof, and an insertion cavity formed among the base and the two lateral frames, wherein the base has a plurality of protruding grooves disposed thereon and a plurality of slots respectively defined between each two of the protruding grooves, one of the protruding grooves correspondingly has a block disposed thereon and defining a baffle surface formed thereon;
  - a plurality of first contacts respectively arranged in the slots;
- 10 a second contact connecting the insulating housing and having a contact arm; and
  - a third contact assembled in the insulating housing and having a resilient arm, the resilient arm including a baffle strip extending downwardly from a free end thereof, wherein the resilient arm arranges in front of the contact arm of the second contact, and the baffle strip disposes between the baffle surface of the block and a side surface of the corresponding protruding groove, the baffle strip retains against the baffle surface of the block to be oriented, while the resilient arm swings forwardly with a predetermined angle.
2. The card connector as claimed in claim 1, wherein each of the first contacts has a contact portion and an extending portion extending out of the insulating housing.
- 20 3. The card connector as claimed in claim 1, wherein the second contact includes a body, a soldering portion and a resilient member, the contact arm extends horizontally from an upper edge of a first side of the body, the

soldering portion folds from a lower edge of the body, the resilient member extends horizontally from an upper edge of a second side of the body.

4. The card connector as claimed in claim 1, wherein third contact includes a main portion and a welding portion, the resilient arm extends horizontally from an upper edge of the main portion and tilts with an inclined angle, and the welding portion folds from a lower edge of the main portion.
5. The card connector as claimed in claim 1, wherein the resilient arm tilts forwardly to retain against the block with an inclined angle.
6. The card connector as claimed in claim 1, wherein the third contact includes a supporting portion arranged in an inner side of the baffle strip to straddle over the corresponding protruding groove.

## ABSTRACT

A card connector includes an insulating housing being a plurality of slots and having a block disposed thereon and defining a baffle surface formed thereon, a plurality of first contacts respectively arranged in the slots, a second contact connects 5 the insulating housing and having a contact arm, and a third contact assembled in the insulating housing and having a resilient arm, wherein the resilient arm arranges in front of the contact arm of the second contact, the resilient arm includes a baffle strip extending downwardly from a free end thereof, and the baffle strip disposes between the baffle surface of the block and a side surface of the corresponding protruding 10 groove, the baffle strip retains against the baffle surface of the block to be oriented, while the resilient arm swings forwardly with a predetermined angle.

Reference:

insulating housing 10, 60, 70

base 11, 64, 74

side frame 12, 65, 75

receiving cavity 13, 66, 76

slot 14, 77

protruding groove 15, 78

corner 151

block 16, 79

baffle surface 161

first contact 20, 61, 71

contact portion 21

extending portion 22

second portion 30, 62, 72

body 31,

contact arm 32, 67, 81

soldering portion 33

resilient member 34

third contact 40, 63, 73

main portion 41

resilient arm 42, 68, 80

welding portion 43

baffle strip 44

supporting portion 45

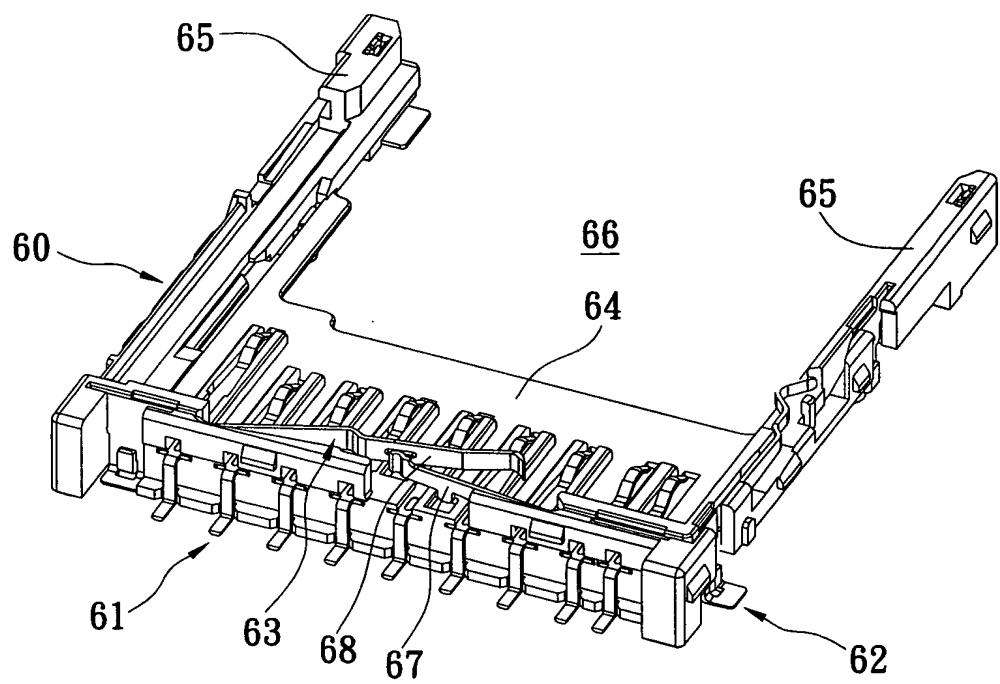


FIG. 1  
PRIOR ART

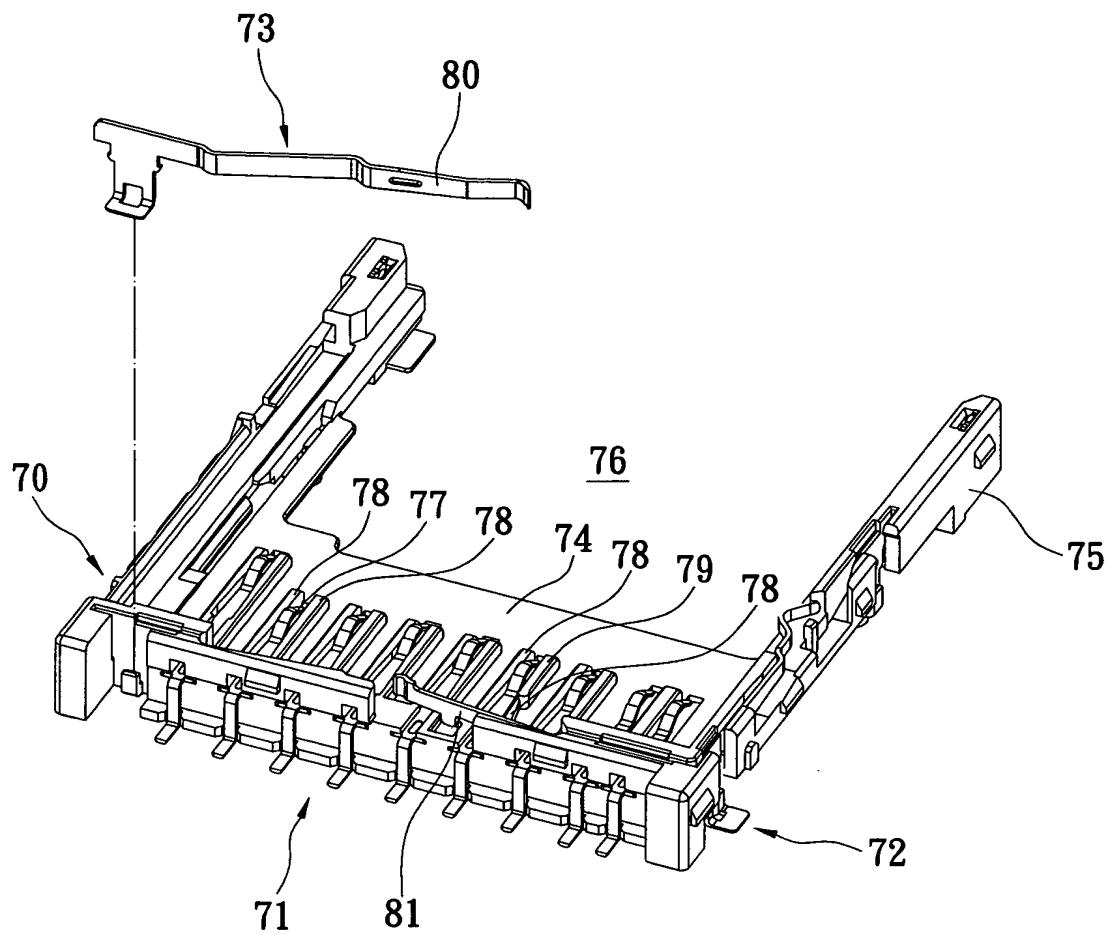


FIG. 2  
PRIOR ART

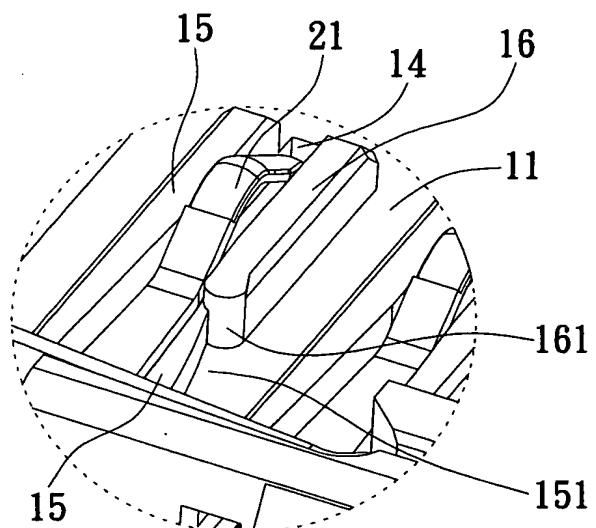


FIG. 3A

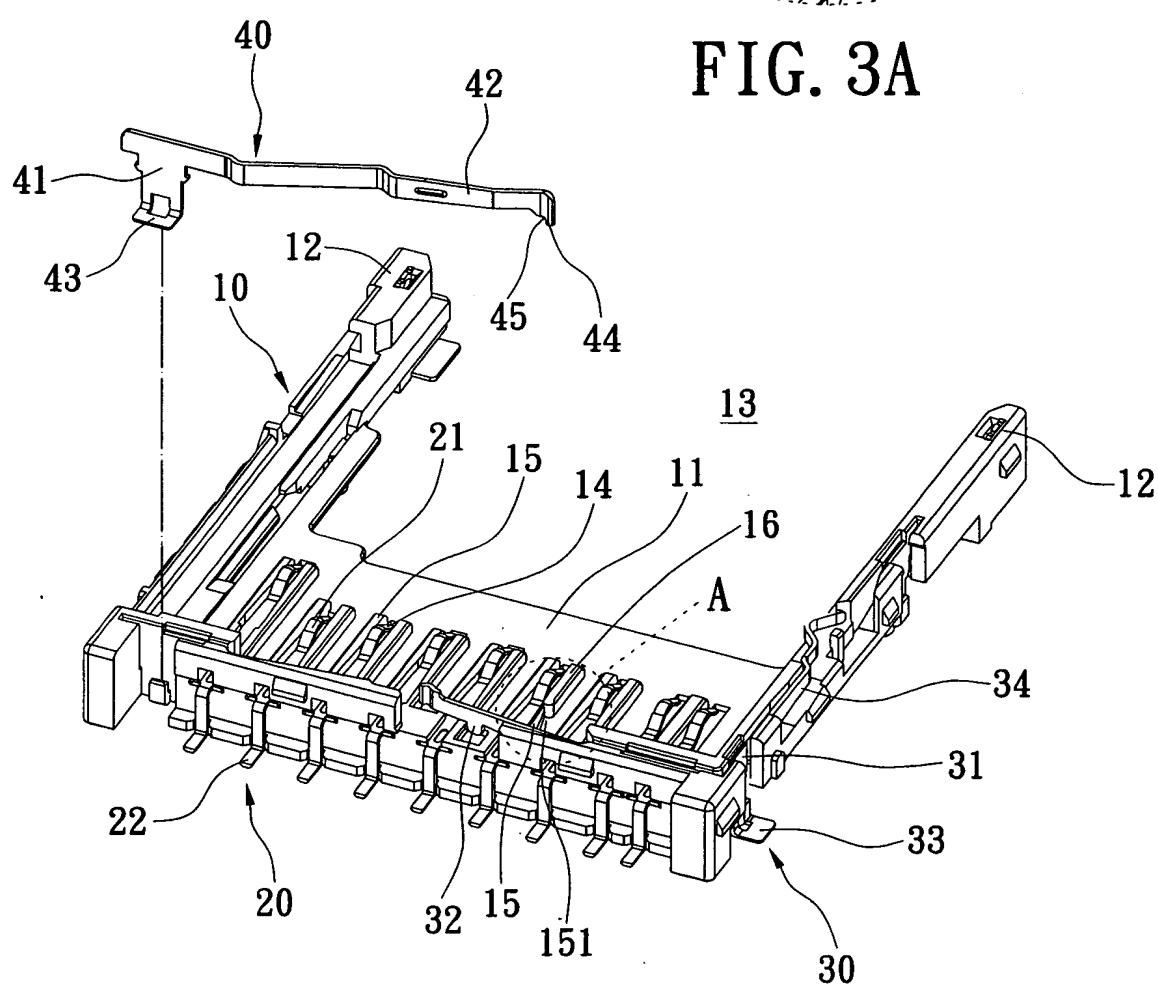


FIG. 3

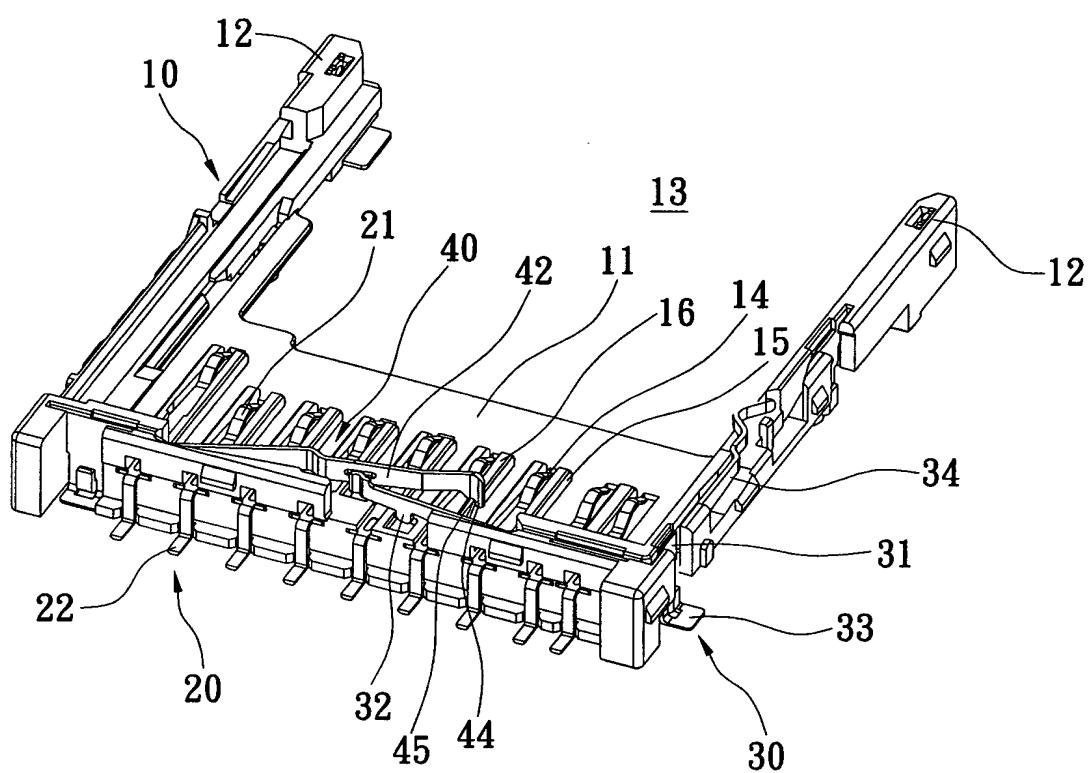


FIG. 4

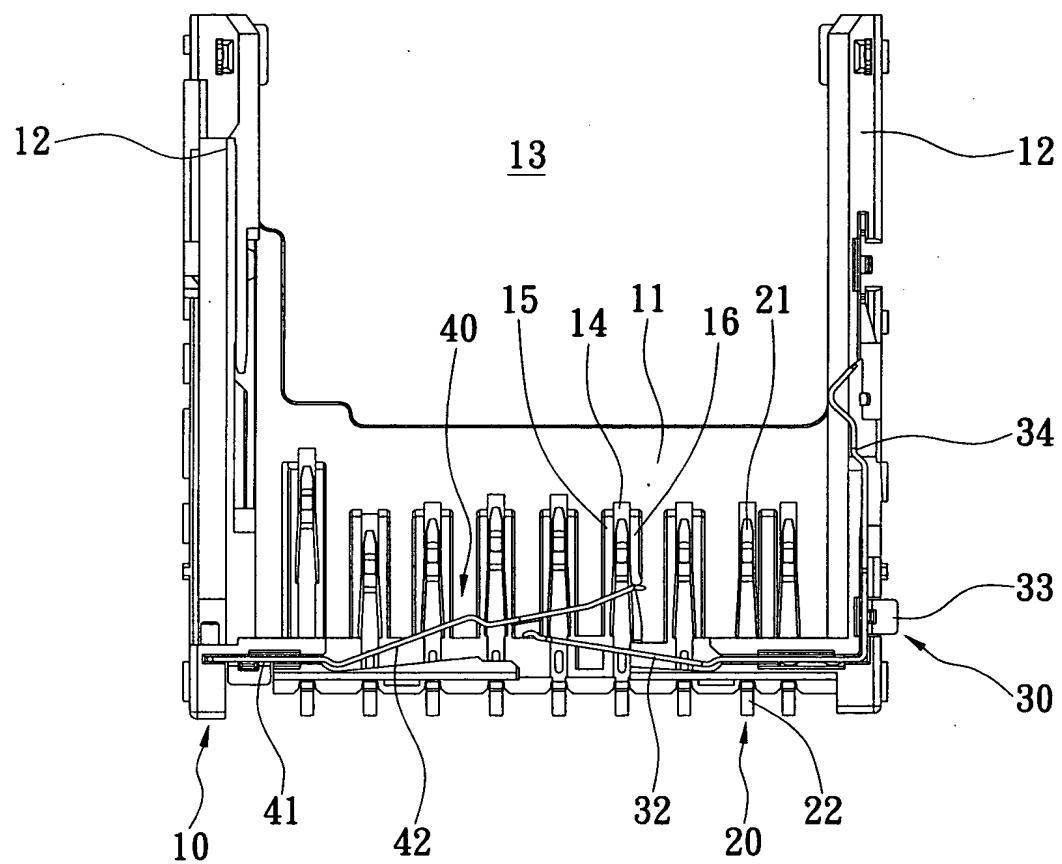


FIG. 5

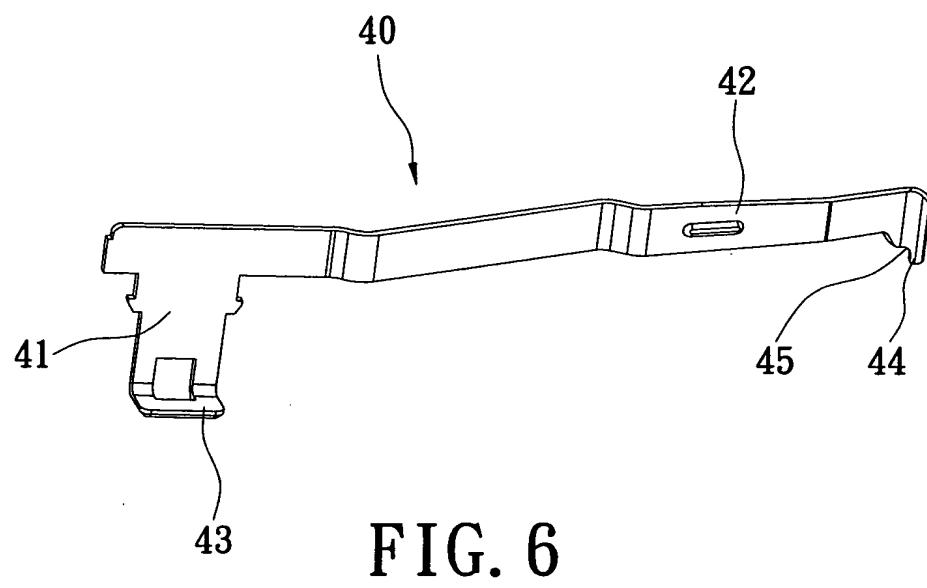


FIG. 6

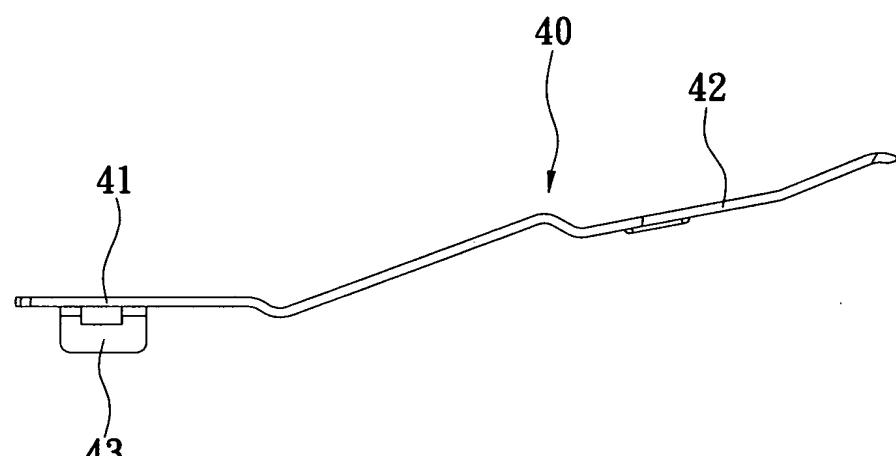


FIG. 7